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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 5652F

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Superseding AMS 5652E

Submitted for recognition as an American National Standard

STEEL, CORROSION AND HEAT RESISTANT, BARS, WIRE, FORGINGS, TUBING, AND RINGS 25Cr - 20Ni - 2.0Si (SAE 30314) Solution Heat Treated

UNS S31400

1. SCOPE:

1.1 Form:

This specification covers a corrosion and heat resistant steel in the form of bars, wire, forgings, mechanical tubing, flash welded rings, and stock for forging or flash welded rings.

1.2 Application:

These products have been used typically for parts requiring good corrosion resistance and which will be subjected to elevated temperatures during fabrication or in service and for parts requiring oxidation resistance up to 2000 °F (1093 °C) but useful at the higher temperatures only when stresses are low, but usage is not limited to such applications. Strength at elevated temperatures is similar to that of the 18-8 type steels. The specified silicon content improves oxidation resistance with some sacrifice of weldability and ductility.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2241 Tolerances, Corrosion and Heat Resistant Steel, Iron Alloy, Titanium, and Titanium Alloy Bars and Wire
MAM 2241 Tolerances, Metric, Corrosion and Heat Resistant Steel, Iron Alloy, Titanium, and Titanium Alloy Bars and Wire

Printed in U.S.A.
91-0942/ EG

2.1 SAE Publications (Continued):

AMS 2243 Tolerances, Corrosion and Heat Resistant Steel Tubing
MAM 2243 Tolerances, Metric, Corrosion and Heat Resistant Steel Tubing
AMS 2248 Chemical Check Analysis Limits, Wrought Corrosion and Heat Resistant Steels and Alloys, Maraging and Other Highly-Alloyed Steels, and Iron Alloys
AMS 2371 Quality Assurance Sampling and Testing, Corrosion and Heat Resistant Steels and Alloys, Wrought Products and Forging Stock
AMS 2374 Quality Assurance Sampling and Testing, Corrosion and Heat Resistant Steel and Alloy Forgings
AMS 2806 Identification, Bars, Wire, Mechanical Tubing, and Extrusions, Carbon and Alloy Steels and Corrosion and Heat Resistant Steels and Alloys
AMS 2808 Identification, Forgings
AMS 7490 Rings, Flash Welded, Corrosion and Heat Resistant Austenitic Steels and Austenitic-Type Alloys

2.2 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM A 370 Mechanical Testing of Steel Products
ASTM E 353 Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron Alloys

2.3 U.S. Government Publications:

Available from Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-STD-163 Steel Mill Products, Preparation for Shipment and Storage

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

(R)

Shall conform to the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E 353, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - Composition

Element	min	max
Carbon	--	0.18
Manganese	1.00	2.00
Silicon	1.50	2.30
Phosphorus	--	0.040
Sulfur	--	0.030
Chromium	23.00	25.00
Nickel	19.00	22.00
Molybdenum	--	0.75
Copper	--	0.75

3.1.1 Check Analysis: Composition variations shall meet the requirements of AMS 2248.

3.2 Condition:

The product shall be supplied in the following condition:

3.2.1 Bars, Wire, Forgings, Mechanical Tubing, and Flash Welded Rings: Solution heat treated free from continuous carbide network.

3.2.1.1 Bars and Wire:

3.2.1.1.1 All hexagons, other bars 2.75 inches (69.85 mm) and under in nominal diameter or distance between parallel sides, and wire shall be cold finished.

3.2.1.1.2 Bars, other than hexagons, over 2.75 inches (69.85 mm) in nominal diameter or distance between parallel sides shall be hot finished and descaled.

3.2.1.2 Mechanical Tubing: Shall be cold finished.

3.2.1.3 Flash Welded Rings: Shall not be supplied unless specified or permitted on purchaser's part drawing. When supplied, rings shall be manufactured in accordance with AMS 7490.

3.2.2 Stock for Forging or Flash Welded Rings: As ordered by the forging or flash welded ring manufacturer.

3.3 Properties:

The product shall conform to the following requirements; hardness and tensile testing shall be performed in accordance with ASTM A 370:

3.3.1 Hardness:

3.3.1.1 Bars: Not higher than 187 HB, or equivalent, determined approximately midway between surface and center, except that if supplied cold finished, hardness may be as high as 229 HB, or equivalent.

3.3.1.2 Forgings and Flash Welded Rings: Not higher than 187 HB, or equivalent.

3.3.1.3 Mechanical Tubing: Not higher than 90 HRB, or equivalent, determined approximately midway between outer and inner surfaces.

3.3.2 Tensile Properties: Wire shall have tensile strength not higher than 125 ksi (862 MPa).

3.4 Quality:

The product, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from imperfections detrimental to usage of the product.

3.5 Tolerances:

Shall conform to all applicable requirements of the following:

3.5.1 Bars and Wire: AMS 2241 or MAM 2241.

3.5.2 Mechanical Tubing: AMS 2243 or MAM 2243.

4. QUALITY ASSURANCE PROVISIONS:

4.1 (R) Responsibility for Inspection: The vendor of the product shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to the requirements of this specification.

4.2 Classification of Tests:

Tests for all technical requirements are acceptance tests and shall be performed on each heat or lot as applicable.

4.3 (R) Sampling and Testing:

Shall be in accordance with the following:

4.3.1 Bars, Wire, Mechanical Tubing, Flash Welded Rings, and Stock for Forging or Flash Welded Rings: AMS 2371.

4.3.2 Forgings: AMS 2374.